

# Endoscopic Evacuation of Intracerebral Haemorrhage

A 4 year single centre experience at National University Hospital,  
Singapore

Swati Jain, Sein Lwin, Tseng Tsai Yeo, Chou Ning

Presented By:

Dr. Swati Jain

Resident, Division of Neurosurgery

Department of General Surgery

National University Hospital System (NUHS), Singapore

Consultant in-charge: Dr. Sein Lwin

# Introduction

- Stroke in Singapore
  - Second highest cause of pre-mature mortality
  - Eighth highest cause of disability burden
- Spontaneous Intra-cerebral Haemorrhage (sICH) secondary to uncontrolled hypertension carries high mortality and morbidity
  - Catastrophic outcome in nearly three-quarters of the patients
- No consensus with regards to acceptable methods of management
  - Primary versus secondary insult
  - Damage to eloquent areas of speech and motor skills during surgical intervention

# Introduction

- Endoscopic evacuation
  - Improved haematoma evacuation rate, lower mortality and complication rate
  - Lack large prospective randomised trials to show superiority of this method over conventional decompressive craniectomies
- This study presents our own experience with use of endoscopic evacuation of spontaneous intra-cerebral haemorrhage over a 4 year period

# Materials and Methods

- Retrospective analysis
  - All patients who underwent endoscopic evacuation from 1<sup>st</sup> January 2012 to 31<sup>st</sup> December 2016
  - Primary sICH with no evidence of aneurysm/ arteriovenous malformation

# Materials and Methods

- Endoscopic Evacuation of Haemorrhage
  - Brainlab frameless neuro navigation used to pre-plan the entry point and trajectory of endoscopic sheath along the long axis of the haematoma
  - Linear incision over the superior margin of the eyebrow
  - Corticotomy done and expandable plastic sheath inserted to about three quarters of the clot length and clot evacuated under direct visualisation
  - Haemostasis secured
  - Closure and dressing

# Results

## Demographics

- 32 patients who underwent endoscopic evacuation over 4 year period
  - 18 males, 14 females
  - Mean age at time of presentation 55 years
  - Median Charlson comorbidity score 0
  - Median GCS at time of presentation 8
    - Median verbal score on arrival 1

## Anti-platelets/ anti-coagulation status

- 6 patients were on anti-platelets (aspirin/ Plavix), 2 patients on warfarin, 1 patient had been given intravenous tPA prior to development of haematoma

# Results

## Haematoma Characteristics

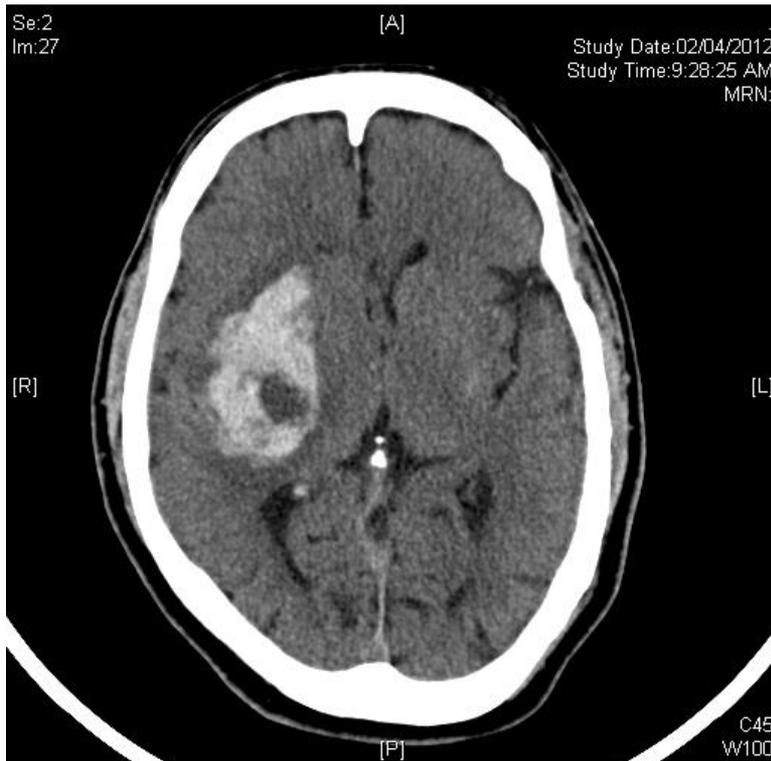
- Equal distribution of left and right haematomas, 16 patients in each
- Location ranged from basal ganglia, thalamic, diffused intraparenchymal haematoma
- Pre-operative haematoma size  $74.22 \pm 41.41 \text{ cm}^3$  with a midline shift of  $10.5 \pm 4.6 \text{ mm}$

## Operative Characteristics

- Time spent in the surgery was defined as time taken from the first skin incision after surgery preparation to the skin closure. The average time spent in the surgery was  **$62.5 \pm 20.0$  minutes.**
- Blood loss 103 mls

# Results

- The mean post-operative volume after endoscopic evacuation was  **$28.61 \pm 47.1 \text{ cm}^3$**  (0 – 258.7  $\text{cm}^3$ ) with an improvement in the mass effect, with an average midline shift of **5.6 mm**



## Results (Post-operative outcomes)

- Patients undergoing endoscopic evacuation spent a median of 8.5 days in the ICU/HD unit
- 8 patients needed re-operation of which 3 required re-evacuation of haematoma through conventional craniectomy, 1 via endoscope and other 4 underwent change of external ventricular drain
- Median mRS in the endoscopic evacuation group was 5
  - Mortality – 15.6%
  - Median GCS on discharge – 11
  - Median verbal score on discharge – 1

# Results (Follow up)

- 21 patients who survived discharge were followed up for a median of 476 days
  - 6 patients were lost to follow up as they were transferred overseas for further follow up and management
- Median mRS on follow up 4
- Median verbal score on follow up 5

# Results



# Discussion

- We achieved a haematoma evacuation volume ranging from - 48.95% to 100%, the latter where no blood was visible on the subsequent CT scan
- Various studies have failed to show any significant difference in functional outcomes when compared with traditional craniectomies
- In our study, mortality rate of 15.6% comparable to published literature

# Conclusion

- The decreased surgical times demonstrated in our study translates into reducing the risks associated with general anaesthesia
- Haemodynamically unstable patients and those with high anaesthetic risk due to underlying cardiac pathologies will be placed at a significant advantage when undergoing minimally invasive surgery
- Longer ICU/HD stays are well known to be associated with prolonged intubation, nosocomial infections especially ventilator associated pneumonia, deep vein thrombosis as well delay in rehabilitation after extubation which affect final outcomes poorly

**NUHS**

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Thank you.

